

a) Label small jar or beaker "septic tank."

b) Pour a well-stirred sample of wastewater into the septic tank until it is about 3/4 full.

c) Allow the sample to settle. Make observations.

d) Prepare a "leach field" as follows: Add alternating layers of sand and potting soil, separated by paper towels to the large jar or beaker. Wet the leach field.

e) Set the septic tank on a book or other riser. Place the leach field directly below the septic tank. Bend the flexible straw and fill it with water. Place fingers over both ends to keep the water in. After the wastewater has settled, connect the septic tank with the leach field as shown. Keep fingers over the ends of the straw until it is placed in the wastewater. This should create a siphon, allowing wastewater to flow onto the leach field. (It may be helpful to demonstrate this step for your students.) Observe the action of wastewater on the leach field.

3. Discuss your results:

❖ What settled to the bottom of the septic tank? What stayed on the surface?

❖ What was filtered out of the wastewater as it passed through the leach field? What was not? As in your septic system model, some components of wastewater (such as bacteria) are usually filtered out by soil. Other components (such as chloride, nitrates and volatile organic chemicals) are not effectively filtered and may be carried into groundwater.

❖ How did the green dye change as it passed through the leach field soil layers? Why?

4. Interview a friend or relative who has a septic tank system (instead of being connected to a municipal wastewater treatment plant). Find answers to the following questions:

❖ Where does their water come from?

❖ If their water is from a private well, how far is the septic tank from their well?

❖ How far is the absorption field from their well?

❖ How far is their house from the septic tank?

❖ How far is their house from the leach field?

❖ Refer to the table on the worksheet. Is there anything closer to the septic tank or absorption field than the recommended minimum separation distance? If so, circle the unit and record next to the table how close it is.

❖ What is one other factor (besides separation distance) to consider when planning a septic system?

Students may find that many people don't know the answers to these questions. Should they? Why is this important? Discuss.

Going Beyond:

1. Investigate and compare different types of septic systems. Invite the county on-site waste disposal specialist to speak to your class. Ask him/her to bring diagrams of conventional and mound systems. Under what circumstances should a mound system be built? Are there other septic tank designs? When are they used?

Adapted from: Groundwater Resources and Educational Activities for Teaching. 1989. Iowa Department of Natural Resources.

